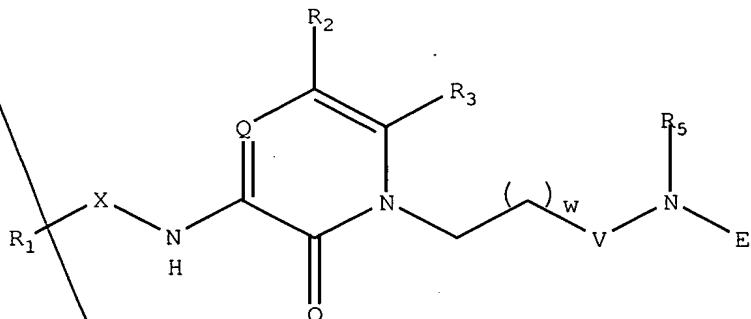


We claim:

1. A compound of the formula:

5

Sub  
A'



(a) X is selected from the group consisting of  
 $-S(O)_2-$ ,  $-N(R')-S(O)_2$ ,  $-S(O)_2-N(R')-$ ,  $-C(=O)-$ ,  $-OC(=O)-$ ,  
 $-NHC(=O)-$ ,  $-C(=O)N(R')-$ ,  $-P(O)(R')-$  and a direct link, wherein R'  
15 is independently hydrogen, alkyl of 1 to about 4 carbon atoms,  
aryl of about 6 to about 14 carbon atoms, aralkyl of about 7 to  
about 16 carbon atoms, with the proviso that when X is  $-P(O)(R')-$   
, the R' is not hydrogen;

(b) R<sub>1</sub> is selected from the group consisting of:

(1) alkyl of 1 to about 12 carbon atoms which is  
optionally substituted with Y<sub>1</sub> and/or Y<sub>2</sub>,

(2) alkyl of 1 to about 6 carbon atoms  
substituted with cycloalkyl of about 3 to about 8 carbon atoms  
which is optionally mono-, di-, or tri-substituted with Y<sub>1</sub>, Y<sub>2</sub>  
25 and/or Y<sub>3</sub>,

(3) cycloalkyl of 3 to about 15 carbon atoms,  
which is optionally mono-, di-, or tri-substituted on the ring  
with Y<sub>1</sub>, Y<sub>2</sub> and/or Y<sub>3</sub>,

(4) heterocycloalkyl of 4 to about 10 ring atoms  
30 with the ring atoms selected from carbon and heteroatoms, wherein  
the heteroatoms are selected from the group consisting of oxygen,

nitrogen, and  $S(O)_i$ , wherein  $i$  is 0, 1 or 2, which is optionally mono-, di-, or tri-substituted on the ring with  $Y_1$ ,  $Y_2$  and/or  $Y_3$ ,

(5) heterocyclo of 4 to about 10 ring atoms with the ring atoms selected from carbon and heteroatoms, wherein the heteroatoms are selected from the group consisting of oxygen,

nitrogen, and  $S(O)_i$ , including  $\text{--N}(\text{G})$ , wherein  $\text{--N}(\text{G})$  is a 5 to 7 member heterocycle of 3 to 6 ring carbon atoms, where  $\text{G}$  is  $-\text{CH}_2-$ ,  $-\text{O}-$ ,  $-\text{S}(\text{=O})-$ ,  $-\text{S}(\text{O})_2-$  or  $-\text{S}-$ , which is optionally mono-, di-, or tri-substituted on the ring carbons with  $\text{Y}_1$ ,  $\text{Y}_2$  and/or  $\text{Y}_3$ .

(6) alkenyl of 2 to about 6 carbon atoms which is optionally substituted with cycloalkyl of 3 to about 8 carbon atoms, which is optionally mono-, di-, or tri-substituted on the ring carbons with  $Y_1$ ,  $Y_2$  and/or  $Y_3$ ,

(7) aryl of about 6 to about 14 carbon atoms which is optionally mono-, di- or tri-substituted with  $Y_1$ ,  $Y_2$ , and/or  $Y_3$ ,

(8) heteroaryl of about 5 to about 14 ring atoms with the ring atoms selected from carbon and heteroatoms, wherein the heteroatoms are selected from oxygen, nitrogen, and sulfur, and which is optionally mono-, di-, or tri-substituted with  $Y_1$ ,  $Y_2$ , and/or  $Y_3$ ,

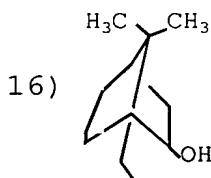
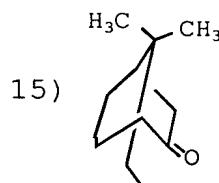
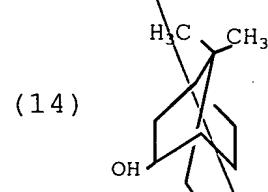
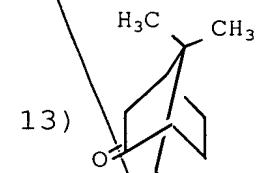
(9) aralkyl of about 7 to about 15 carbon atoms which is optionally substituted on the alkyl chain with hydroxy or halogen and which is optionally mono-, di-, or tri-substituted in the aryl ring with  $Y_1$ ,  $Y_2$ , and/or  $Y_3$ ,

(10) heteroaralkyl of 5 to 14 ring atoms with the ring atoms selected from carbon and heteroatoms, wherein the heteroatoms are selected from oxygen, nitrogen, and sulfur, and which is optionally substituted on the alkyl chain with hydroxy

or halogen and which is optionally mono-, di- or tri-substituted on the ring with  $Y_1$ ,  $Y_2$ , and/or  $Y_3$ ,

5 (11) aralkenyl of about 8 to about 16 carbon atoms which is optionally mono-, di-, or tri-substituted on the aryl ring with  $Y_1$ ,  $Y_2$ , and/or  $Y_3$ ,

10 (12) heteroaralkenyl of 5 to 14 ring atoms with the ring atoms selected from carbon and heteroatoms, wherein the heteroatoms are selected from oxygen, nitrogen, and sulfur, and which is optionally mono-, di- or tri-substituted on the ring with  $Y_1$ ,  $Y_2$ , and/or  $Y_3$ ,



5 (17) fused carbocyclic alkyl of about 5 to about 15 carbon atoms,

10 (18) difluoromethyl or perfluoroalkyl of 1 to about 12 carbon atoms,

15 (19) perfluoroaryl of about 6 to about 14 carbon atoms,

20 (20) perfluoraralkyl of about 7 to about 15 carbon atoms, and

25 (21) hydrogen when X is a direct link;

wherein

30 (i) each  $Y_1$ ,  $Y_2$ , and  $Y_3$  is independently selected from the group consisting of halogen, cyano, nitro, tetrazolyl optionally substituted with alkyl of 1 to about 6 carbon atoms, guanidino, amidino, methylamino, methylguanidino,  $-CF_3$ ,  $-CF_2CF_3$ ,  $-CH(CF_3)_2$ ,  $-C(OH)(CF_3)_2$ ,  $-OCF_3$ ,  $-OCF_2CF_3$ ,  $-OCF_2H$ ,  $-OC(O)NH_2$ ,  $-OC(O)NHZ_1$ ,  $-OC(O)NZ_1Z_2$ ,  $-NHC(O)Z_1$ ,  $-NHC(O)NH_2$ ,  $-NHC(O)NHZ_1$ ,  $-NHC(O)NZ_1Z_2$ ,  $-C(O)OH$ ,  $-C(O)OZ_1$ ,  $-C(O)NH_2$ ,  $-C(O)NHZ_1$ ,  $-C(O)NZ_1Z_2$ ,  $-P(O)_3H_2$ ,  $-P(O)_3(Z_1)_2$ ,  $-S(O)_3H$ ,  $-S(O)_pZ_1$ ,  $-Z_1$ ,  $-OZ_1$ ,  $-OH$ ,  $-NH_2$ ,  $-NHZ_1$ ,  $-NZ_1Z_2$ , N-morpholino, and  $-S(O)_p(CF_2)_qCF_3$ , wherein p is 0, 1 or 2, q is an integer from 0 to 5, and  $Z_1$  and  $Z_2$  are independently selected from the group consisting of alkyl of 1 to about 12 carbon atoms, aryl of about 6 to about 14 carbon atoms, heteroaryl of about 5 to about 14 atoms having 1 to about 9 carbon atoms, aralkyl of about 7 to about 15 carbon atoms, and heteroaralkyl of about 5 to about 14 ring atoms, or

35 (ii)  $Y_1$  and  $Y_2$  are selected together to be  $-O[C(Z_3)(Z_4)]_rO-$  or  $-O[C(Z_3)(Z_4)]_{r+1}-$ , wherein r is an integer from 1 to 4 and  $Z_3$  and  $Z_4$  are independently selected from the group consisting of hydrogen, alkyl or 1 to about 12 carbon atoms, aryl

5 of about 6 to about 14 carbon atoms, heteroaryl of about 5 to about 14 ring atoms having 1 to about 9 carbon atoms, aralkyl of about 7 to about 15 carbon atoms, and heteroaralkyl of about 5 to about 14 ring atoms;

10 (c) Q is -N- or -C(R<sub>4</sub>)-;  
(d) R<sub>2</sub> is selected from the group consisting of hydrogen, halogen and alkyl of 1 to about 6 carbon atoms;  
(e) R<sub>3</sub> is selected from the group consisting of hydrogen, alkyl 1 to about 6 carbon atoms, cycloalkyl of 3 to about 7 carbon atoms, alkoxy of 1 to about 6 carbon atoms, halogen, and trifluoromethyl;

15 (f) alternatively, R<sub>2</sub> and R<sub>3</sub> are selected together and are -(CH<sub>2</sub>)<sub>k</sub>- where k is 3 or 4;

20 (g) R<sub>4</sub> is selected from the group consisting of hydrogen, alkyl of 1 to about 8 carbon atoms, hydroxy, alkoxy of 1 to about 8 carbon atoms, aralkyl of 7 to about 15 carbon atoms, alkyl of 1 to about 5 carbon atoms substituted with cycloalkyl of 3 to about 8 carbon atoms, -NHR<sub>8</sub>, -S(O)<sub>t</sub>R<sub>8</sub> and -C(=O)R<sub>8</sub> where t is 0, 1 or 2;

25 (h) w is 0, 1 or 2;

(i) V is -CH(R<sub>9</sub>)-, -C(=O)-, -O-, -S(O)<sub>2</sub>- or a direct link;

30 (j) R<sub>5</sub> is hydrogen or alkyl of 1 to about 6 carbon atoms;

(k) E is heteroaryl of about 6 to about 10 ring atoms having from 1 to about 4 ring nitrogen atoms and the remainder of the ring atoms carbon atoms and which is substituted with R<sub>6</sub> and R<sub>7</sub>;

(l) R<sub>6</sub> and R<sub>7</sub> are independently selected from the group consisting of hydrogen, halogen, hydroxy, alkyl of 1 to about 6

*Solv* 5  
*All*  
carbon atoms, alkoxy of 1 to about 6 carbon atoms, alkyl of 1 to about 4 carbon atoms substituted with alkoxy of 1 to about 4 carbon atoms, trifluoromethyl,  $-C(=O)OR_{10}$ ,  $-NHR_{10}$ ,  $C(=O)R_{10}$ ,  $-C(=O)NHR_{10}$ ,  $-OC(=O)NHR_{10}$ ,  $-C(=NR_{10})NHR_{11}$ , and  $-N(R_{12})-C(=NR_{10})NHR_{11}$ ; and

10 (m)  $R_8$ ,  $R_9$ ,  $R_{10}$ ,  $R_{11}$  and  $R_{12}$  are independently selected from the group consisting of hydrogen, alkyl of 1 to about 6 carbon atoms and  $-(CF_2)_jCF_3$  wherein  $j$  is 0, 1, 2 or 3; and pharmaceutically acceptable salts thereof.

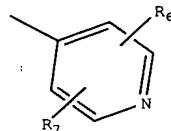
2. A compound according to claim 1 wherein V is  $-CH(R_9)-$ .

3. A compound according to claim 2 wherein  $R_9$  is hydrogen.

4. A compound according to claim 3 wherein X is  $-S(O)_2-$  or a direct link.

5. A compound according to claim 4 wherein  $R_1$  is substituted or unsubstituted aralkyl.

6. A compound according to claim 5 wherein E is



25

7. A compound according to claim 6 wherein  $R_6$  and  $R_7$  are independently hydrogen or halogen.

8. A compound according to claim 7 wherein at least one of  $R_6$  and  $R_7$  is hydrogen.

9. A compound according to claim 8 wherein Q is  $-C(R_4)-$ .

10. A compound according to claim 9 wherein w is 1.

Sub 5 A2  
11. A compound according to claim 8 wherein Q is -N-.

12. a compound according to claim 11 wherein w is 1.

13. A compound according to claim 2 wherein Q is -C(R<sub>4</sub>)-.

10 Sub 14. A compound according to claim 13 wherein X is -S(O)<sub>2</sub>-.

15. A compound according to claim 14 wherein R<sub>9</sub> is hydrogen or methyl.

16. A compound according to claim 2 wherein Q is -N-.

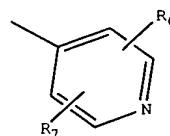
17. A compound according to claim 14 wherein X is a direct link.

Sub 18. A compound according to claim 17 wherein R<sub>1</sub> is substituted or unsubstituted aralkyl.

19. A compound according to claim 18 wherein R<sub>9</sub> is hydrogen.

20. A compound according to claim 19 wherein w is 0 or 1.

25 21. A compound according to claim 1 wherein E is



30 22. A compound according to claim 21 wherein R<sub>6</sub> and R<sub>7</sub> are independently hydrogen or halogen.

23. A compound according to claim 22 wherein at least one of R<sub>6</sub> and R<sub>7</sub> is hydrogen.

5

24. A compound according to claim 21 wherein V is -C(R<sub>9</sub>)-.

25. A compound according to claim 24 wherein R<sub>9</sub> is hydrogen or methyl.

10 26. A compound according to claim 2 wherein X is -S(O)<sub>2</sub>- or a direct link.

15 27. A compound according to claim 26 wherein R<sub>1</sub> is unsubstituted aralkyl, substituted aralkyl or alkyl substituted with cycloalkyl in which the cycloalkyl group is substituted with aryl or heteroaryl.

28. A compound according to claim 27 wherein R<sub>2</sub> is hydrogen and R<sub>3</sub> is hydrogen or methyl.

20 29. A compound according to claim 28 wherein R<sub>3</sub> is methyl.

30. A compound according to claim 29 wherein Q is -N-.

31. A compound according to claim 30 wherein X is a direct link.

25

32. A compound according to claim 31 wherein R<sub>1</sub> is selected from 2,2-dihalo-2-phenyl-ethyl, 2-(1-phenylcyclopropyl)-ethyl and 2-(1-pyridylcyclopropyl)-ethyl.

*Sch*  
AS 30 33. A compound according to claim 1 selected from the compounds depicted in Figures 1A and 1B.

34. A pharmaceutical composition for treating or decreasing the incidence of a condition in a mammal characterized by

abnormal thrombosis, comprising a therapeutically acceptable carrier, and a therapeutically effective amount of compound of 5 claim 1.

35. A pharmaceutical composition for treating or decreasing the incidence of a condition in a mammal characterized by abnormal thrombosis, comprising a therapeutically acceptable carrier, and a therapeutically effective amount of compound of 10 claim 2.

36. A pharmaceutical composition for treating or decreasing the incidence of a condition in a mammal characterized by abnormal thrombosis, comprising a therapeutically acceptable carrier, and a therapeutically effective amount of compound of 15 claim 6.

37. A pharmaceutical composition for treating or decreasing the incidence of a condition in a mammal characterized by abnormal thrombosis, comprising a therapeutically acceptable carrier, and a therapeutically effective amount of compound of 20 claim 15.

38. A pharmaceutical composition for treating or decreasing the incidence of a condition in a mammal characterized by abnormal thrombosis, comprising a therapeutically acceptable carrier, and a therapeutically effective amount of compound of 25 claim 19.

39. A pharmaceutical composition for treating or decreasing the incidence of a condition in a mammal characterized by abnormal thrombosis, comprising a therapeutically acceptable carrier, and a therapeutically effective amount of compound of 30 claim 31.

40. A pharmaceutical composition for treating or decreasing the incidence of a condition in a mammal characterized by

*SJ*  
*AK 5*  
abnormal thrombosis, comprising a therapeutically acceptable carrier, and a therapeutically effective amount of compound of claim 32.

41. A pharmaceutical composition for treating or decreasing the incidence of a condition in a mammal characterized by abnormal thrombosis, comprising a therapeutically acceptable carrier, and a therapeutically effective amount of compound of claim 33.

42. A method for treating or decreasing the incidence of a condition in a mammal characterized by abnormal thrombosis, comprising administering to said mammal a therapeutically effective amount of the compound of claim 1.

43. A method for treating or decreasing the incidence of a condition in a mammal characterized by abnormal thrombosis, comprising administering to said mammal a therapeutically effective amount of the compound of claim 2.

44. A method for treating or decreasing the incidence of a condition in a mammal characterized by abnormal thrombosis, comprising administering to said mammal a therapeutically effective amount of the compound of claim 6.

45. A method for treating or decreasing the incidence of a condition in a mammal characterized by abnormal thrombosis, comprising administering to said mammal a therapeutically effective amount of the compound of claim 15.

46. A method for treating or decreasing the incidence of a condition in a mammal characterized by abnormal thrombosis, comprising administering to said mammal a therapeutically effective amount of the compound of claim 19.

47. A method for treating or decreasing the incidence of a condition in a mammal characterized by abnormal thrombosis,

comprising administering to said mammal a therapeutically effective amount of the compound of claim 31.

*Sub 5*  
*AM*  
48. A method for treating or decreasing the incidence of a condition in a mammal characterized by abnormal thrombosis, comprising administering to said mammal a therapeutically effective amount of the compound of claim 32.

10 49. A method for treating or decreasing the incidence of a condition in a mammal characterized by abnormal thrombosis, comprising administering to said mammal a therapeutically effective amount of the compound of claim 33.

15  
20  
25  
30  
35  
40  
45  
50  
55  
60  
65  
70  
75  
80  
85  
90  
95  
100

*add*  
*A8*

*add*  
*B12*

25

30